**Course: Math 8 CCSS Standard Number(s): 8.EE.1 (Prerequisite skill) Day: 1**

**Unit # and Title: Unit One-Expressions & the Number System Block(s)/Period(s): 1 2 3 4 5 6**

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| **Unit Essential Question(s):** | **When would you use the properties of integer exponents?**  **Why would you find rational approximations of irrational numbers?**  **In what ways can rational numbers be useful?** | | |
| **Learning Target(s)**  **“I can statements”** | **I can express numbers in exponential, expanded, or standard form.** | | |
| **Essential Vocabulary** | **Power, Base, Exponent, Exponential Form, Standard Form, Expanded Form** | | |
| **Resources and Materials** | **Teacher** | | **Student** |
| [Intro to Exponents PowerPoint](http://granicher.wikispaces.com/Exponents+and+Powers)  [**http://www.teachersdomain.org/resource/vtl07.math.number.exp.lpexpopad/**](http://www.teachersdomain.org/resource/vtl07.math.number.exp.lpexpopad/)  [**http://betterlesson.com/document/82779/day-1-6-n-23-24-sh-intro-to-exponents?from=interllective**](http://betterlesson.com/document/82779/day-1-6-n-23-24-sh-intro-to-exponents?from=interllective)  Dice  Copies of Notes | | **Calculator**  **Prior Knowledge & Exit Slip (Attached)** |
| **8 Mathematical Practices:** | | | |
| * 1. Make sense of problems and persevere in solving them. * 2. Reason abstractly and quantitatively. * 3. Construct viable arguments and critique the reasoning of others. * 4. Model with mathematics. | | * 5. Use appropriate tools strategically. * 6. Attend to precision. * 7. Look for and make use of structure. * 8. Look for and express regularity in repeated reasoning. | |
| **Activating Strategy**  **(Opening Activity)** | **Brain Duster/Warm up**  Using a calculator, students will find the value for each of the problems below.   1. 31= 2. 3 • 3 = 3. 3² = 4. 3³ = 5. 3 • 3 • 3 = 6. 3⁴ = 7. 3 • 3 • 3 • 3 = 8. 3⁵ = 9. 3 • 3 • 3 • 3 • 3 = 10. Use the pattern you see from problems 1-9 to answer these questions:     1. Would the expression 4³ have the same value as the expression 4 x 3? Why or why not?     2. In the exponential expression, 4³, what does the exponent, ³ , tell us to do with the base, 4?   **Assessment of Prior Knowledge**  Students complete the top portion of the prior knowledge/exit slip to rate their prior knowledge. | | |
| **Cognitive Teaching Strategies**  **Me/We/Few/You**  **(TIP-Teacher input**  **SAP-Student actively participates**  **GP – Guided Practice**  **IP-Independent Practice)** | **Understanding, Writing, Expanding, and Evaluating Exponents**  **This lesson is a review of exponential form, standard form, and expanded form prior to teaching the laws of exponents.**  **Depending on where students are coming into the unit, model exponents or have them see if they can complete the problems on their own. The purpose of this lesson is not so much to teach exponents from scratch but to clarify the difference when there are parentheses vs. no parentheses and negatives vs. no negatives prior to introducing the laws of exponents.**  **Teacher Input (ME/WE):**  Million Dollar Job: <http://www.nku.edu/~mathed/milliondollar.pdf>  **Pass out student** [**notes**](http://betterlesson.com/document/82779/day-1-6-n-23-24-sh-intro-to-exponents?from=interllective)**.**  **Review parts of a power**  **Explain exponent basics and the vocabulary associated with exponents, exponential form, standard form, and expanded form, using the** [Intro to Exponents PowerPoint](http://granicher.wikispaces.com/Exponents+and+Powers)  **Review the concept of exponents as repeated multiplication. *If a number is in exponential form, the exponent represents how many times the base is to be used as a factor. A number produced by raising a base to an exponent is called a power.***  **Allow students to work you-try problems as guided practice.**  **Review you-try problems.**  **Few:**  **Have students work with their partner to complete the following table from Big Ideas 9-1.**   |  |  |  | | --- | --- | --- | | Exponential Notation (Power) | Expanded Notation (Repeated Multiplication Form) | Standard Form (Value) | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |  |  |  |   **Ask students to record their observations regarding the solutions.**  **You:**  **Students will complete practice problems and record their observations in their math journal.** | | |
| **Summarizing Strategy**  **(Closing Activity)** | **I’ve Got the Power-Partners Playing With Powers Game:**  Students play against a partner. Give student pairs two dice. Players will take turns rolling both dice and deciding which of the dice will be the base and which will be the exponent. Both players will record his/her exponential expressions and after 5 turns, the players will each find the sum of their 5 answers. The player with the greatest sum wins. | | |
| **Assessment/Homework** | Exit Slip: 5 problems (See attached document) | | |
| **Extending/Refining** | **Exponents Jeopardy**  [**http://www.math-play.com/Exponents-Jeopardy/Exponents-Jeopardy.html**](http://www.math-play.com/Exponents-Jeopardy/Exponents-Jeopardy.html)  **Cyberchase**  [**http://www.teachersdomain.org/resource/vtl07.math.number.exp.lpexpopad/**](http://www.teachersdomain.org/resource/vtl07.math.number.exp.lpexpopad/) | | |

